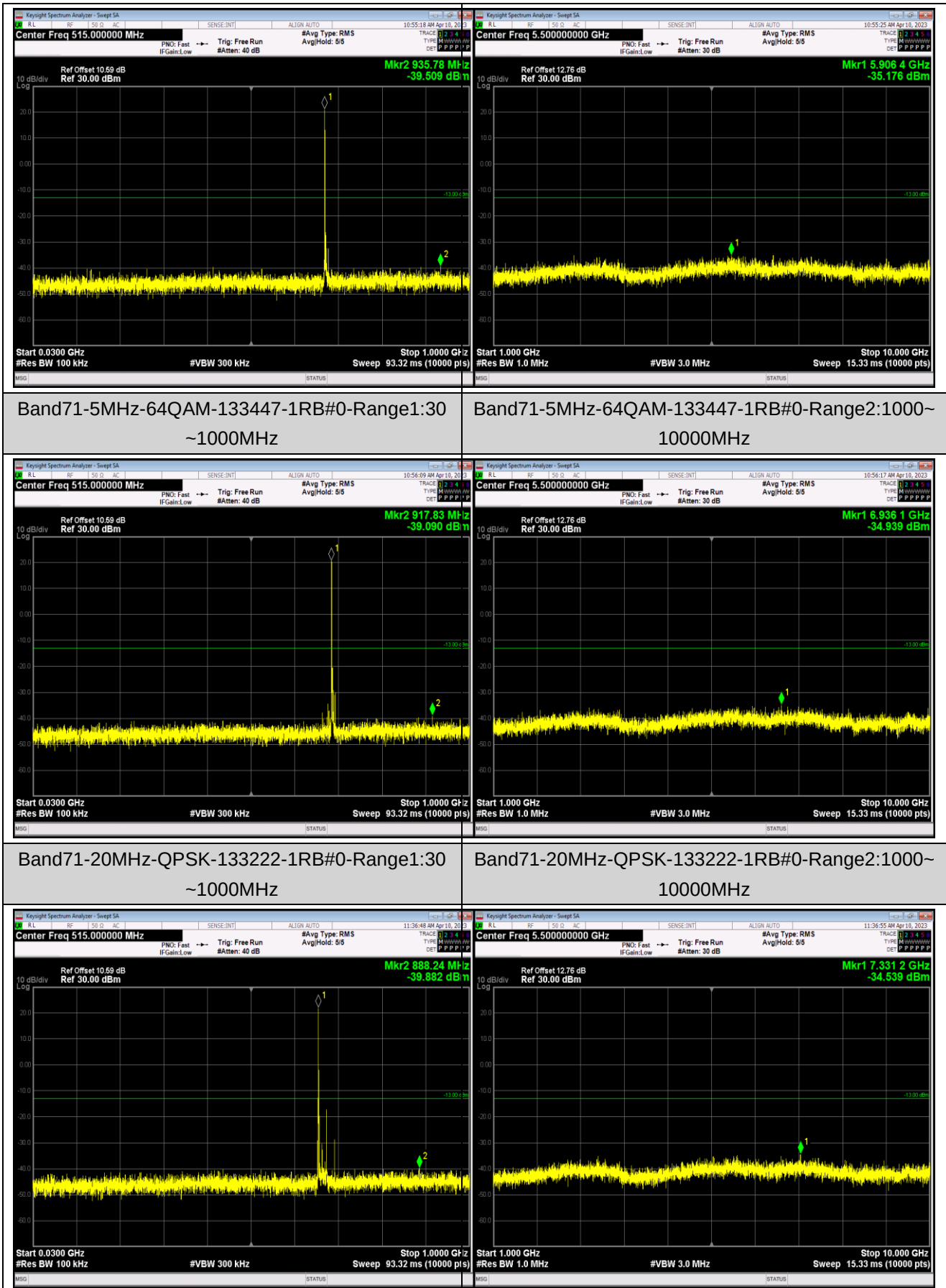
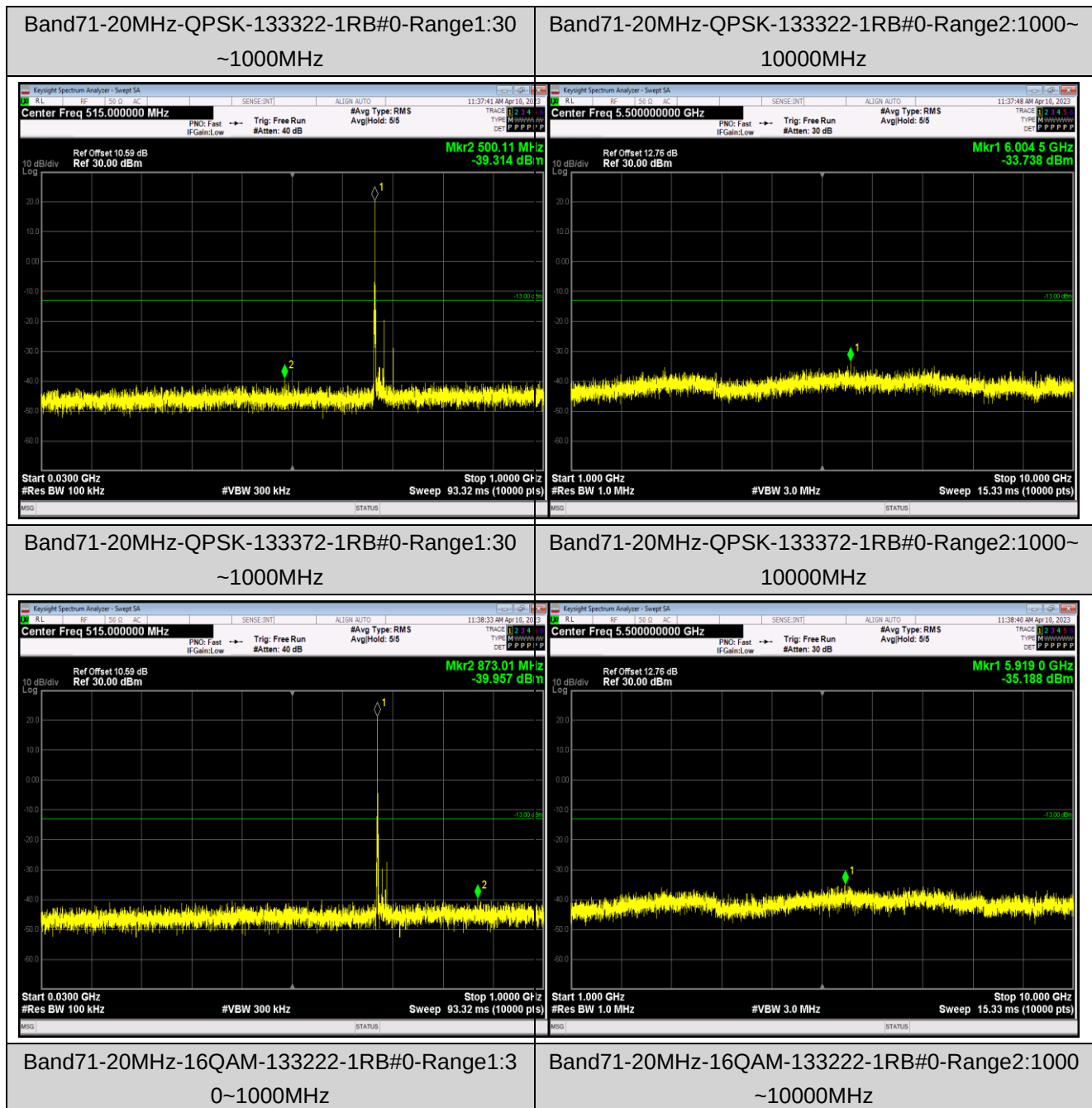
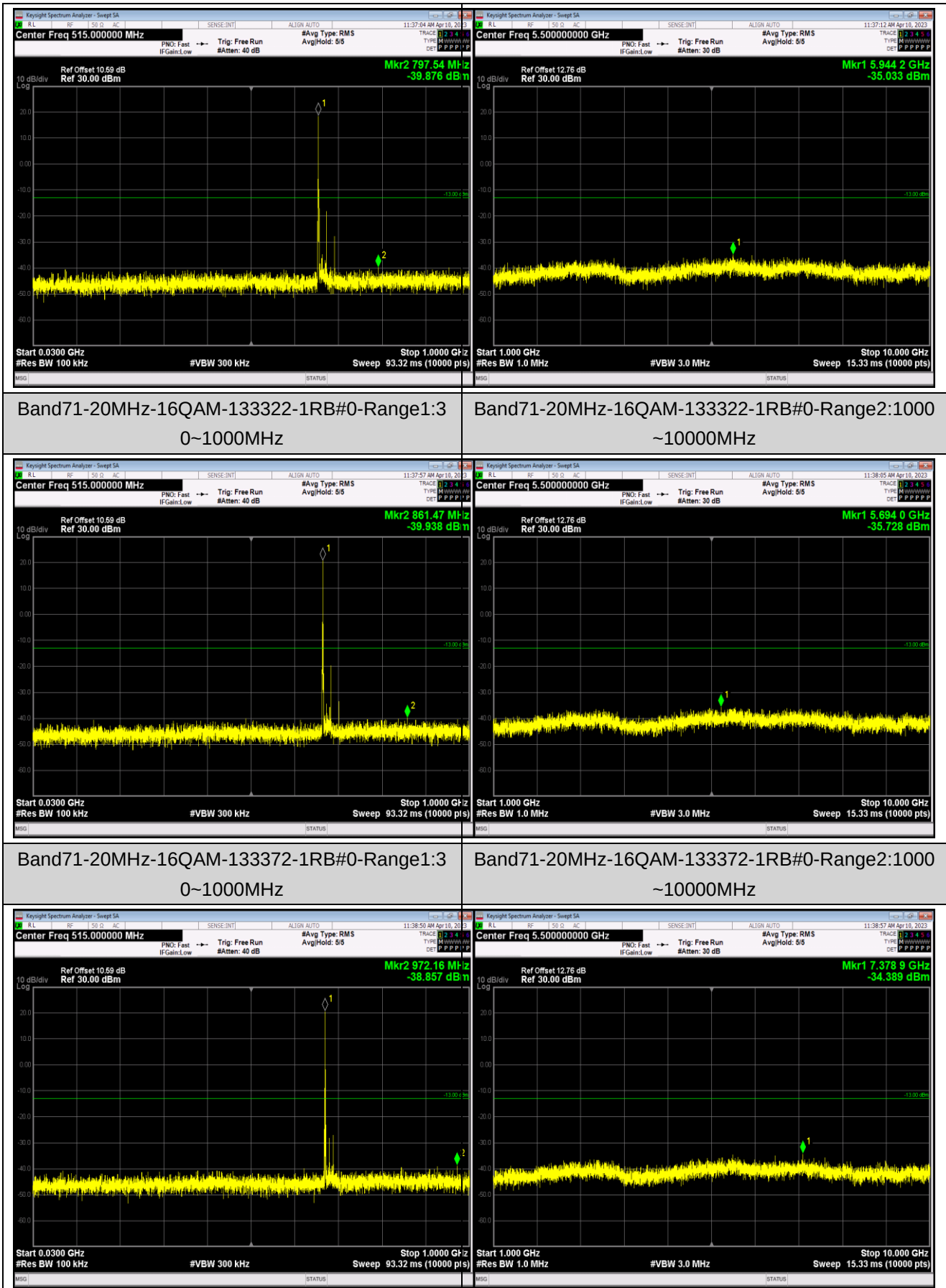
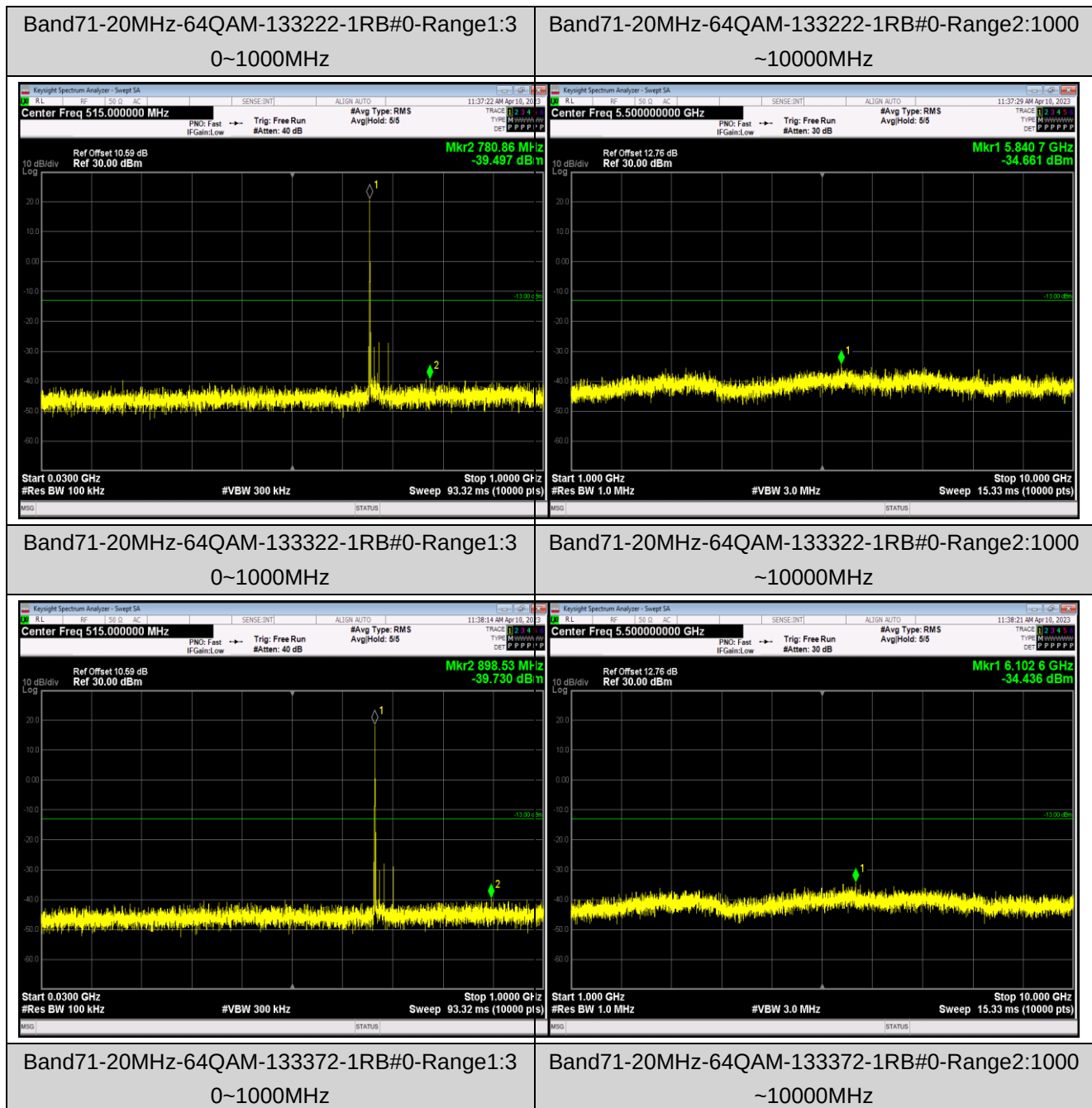
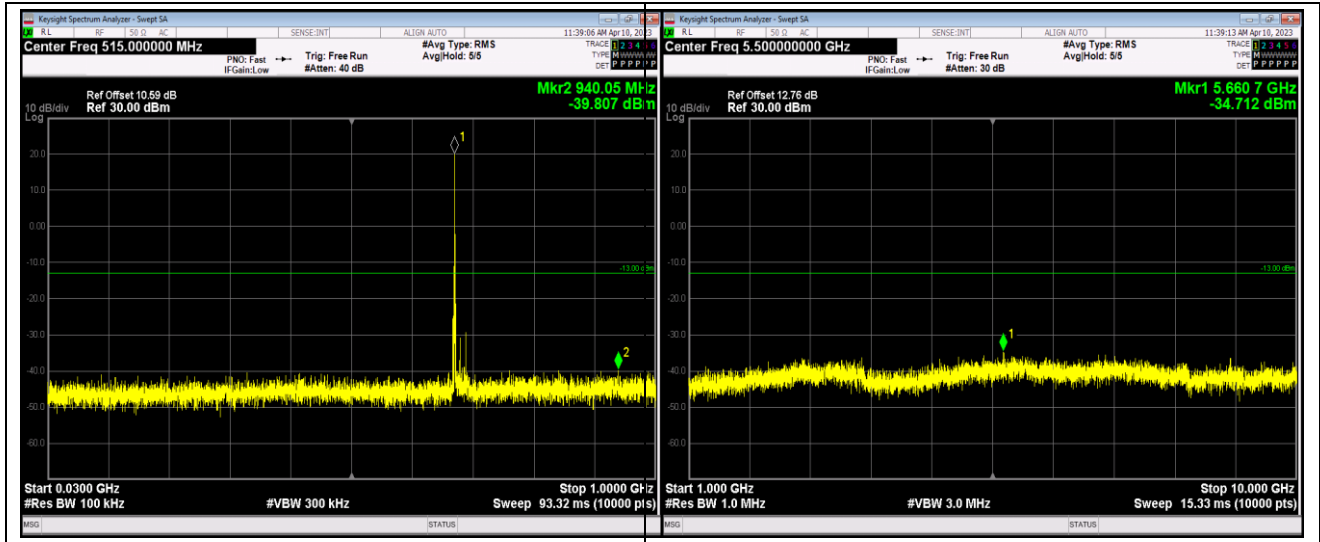












Appendix F: Frequency Stability

Test Result

LTE Band 2 part:

Reference Frequency: LTE Band 2 (10MHz) Middle channel=18900 Frequency=1880.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.7	-30	-8.96	-0.004766	Within authorized band for Band 2	Pass
	-20	-11.70	-0.006223		
	-10	-13.89	-0.007388		
	0	-9.97	-0.005303		
	10	-11.30	-0.006011		
	20	-10.49	-0.005580		
	30	-16.45	-0.008750		
	40	-6.61	-0.003516		
	50	-10.34	-0.005500		
16QAM					
3.7	-30	-16.01	-0.008516	Within authorized band for Band 2	Pass
	-20	-16.52	-0.008787		
	-10	-7.65	-0.004069		
	0	-11.34	-0.006032		
	10	-4.86	-0.002585		
	20	-12.17	-0.006473		
	30	-16.55	-0.008803		
	40	-12.07	-0.006420		
	50	-8.55	-0.004548		
64QAM					
3.7	-30	-14.81	-0.007878	Within authorized band for Band 2	Pass
	-20	-15.79	-0.008399		
	-10	-13.39	-0.007122		
	0	-13.32	-0.007085		
	10	-13.12	-0.006979		
	20	-13.25	-0.007048		
	30	-4.76	-0.002532		
	40	-18.78	-0.009989		
	50	-14.69	-0.007814		
Voltage					
Temperature	Power supplied	Frequency error		Limit (ppm)	Result

(°C)	(Vdc)	Hz	ppm		
QPSK					
25	2.8	-14.12	-0.007511	Within authorized band for Band 2	Pass
	3.7	-15.78	-0.008394		
	4.2	-10.64	-0.005660		
16QAM					
25	2.8	-13.09	-0.006963	Within authorized band for Band 2	Pass
	3.7	-14.61	-0.007771		
	4.2	-11.19	-0.005952		
64QAM					
25	2.8	-14.32	-0.007617	Within authorized band for Band 2	Pass
	3.7	-17.45	-0.009282		
	4.2	-7.00	-0.003723		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 5 part:

Reference Frequency: LTE Band 5(10MHz) Middle channel=20525 Frequency=836.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.7	-30	-10.96	-0.013102	± 2.5	Pass
	-20	-9.93	-0.011871		
	-10	-7.74	-0.009253		
	0	-10.24	-0.012241		
	10	-9.41	-0.011249		
	20	-12.72	-0.015206		
	30	-9.27	-0.011082		
	40	-6.41	-0.007663		
	50	-10.13	-0.012110		
16QAM					
3.7	-30	-11.60	-0.013867	± 2.5	Pass
	-20	-10.86	-0.012983		
	-10	-11.36	-0.013580		
	0	-6.57	-0.007854		
	10	-11.44	-0.013676		
	20	-8.37	-0.010006		
	30	-2.69	-0.003216		
	40	-7.71	-0.009217		
	50	-8.31	-0.009934		
64QAM					
3.7	-30	-7.04	-0.008416	± 2.5	Pass
	-20	-11.73	-0.014023		
	-10	-10.10	-0.012074		
	0	-5.79	-0.006922		
	10	-11.22	-0.013413		
	20	-7.71	-0.009217		
	30	-7.30	-0.008727		
	40	-9.31	-0.011130		
	50	-5.58	-0.006671		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	2.8	-7.20	-0.008607	±2.5	Pass
	3.7	-7.50	-0.008966		
	4.2	-11.07	-0.013234		
16QAM					
25	2.8	-8.50	-0.010161	±2.5	Pass
	3.7	-12.90	-0.015421		
	4.2	-3.33	-0.003981		
64QAM					
25	2.8	-8.05	-0.009623	±2.5	Pass
	3.7	-10.94	-0.013078		
	4.2	-10.29	-0.012301		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 12 part:

Reference Frequency: LTE Band 12(10MHz) Middle channel=23095 Frequency=707.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.7	-30	-3.46	-0.004890	Within authorized band for Band 12	Pass
	-20	-9.10	-0.012862		
	-10	-6.55	-0.009258		
	0	-7.14	-0.010092		
	10	-5.58	-0.007887		
	20	-7.94	-0.011223		
	30	-8.90	-0.012580		
	40	-8.53	-0.012057		
	50	-11.50	-0.016254		
16QAM					
3.7	-30	-4.11	-0.005809	Within authorized band for Band 12	Pass
	-20	-3.60	-0.005088		
	-10	-4.65	-0.006572		
	0	-8.64	-0.012212		
	10	-4.65	-0.006572		
	20	-8.13	-0.011491		
	30	-13.83	-0.019548		
	40	-9.11	-0.012876		
	50	-6.87	-0.009710		
64QAM					
3.7	-30	-7.02	-0.009922	Within authorized band for Band 12	Pass
	-20	-11.23	-0.015873		
	-10	-7.30	-0.010318		
	0	-11.46	-0.016198		
	10	-13.38	-0.018912		
	20	-11.87	-0.016777		
	30	-8.75	-0.012367		
	40	-8.24	-0.011647		
	50	-6.52	-0.009216		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	2.8	-10.09	-0.014261	Within authorized band for Band 12	Pass
	3.7	-6.29	-0.008890		
	4.2	-14.78	-0.020890		
16QAM					
25	2.8	-6.67	-0.009428	Within authorized band for Band 12	Pass
	3.7	-4.66	-0.006587		
	4.2	-13.83	-0.019548		
64QAM					
25	2.8	-4.86	-0.006869	Within authorized band for Band 12	Pass
	3.7	-7.84	-0.011081		
	4.2	-2.65	-0.003746		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 41 part:

Reference Frequency: LTE Band 41 (10MHz) Middle channel=40620 Frequency=2593.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.7	-30	-17.94	-0.006919	Within authorized band for Band 41	Pass
	-20	-15.39	-0.005935		
	-10	-13.52	-0.005214		
	0	-10.66	-0.004111		
	10	-14.38	-0.005546		
	20	5.62	0.002167		
	30	-10.94	-0.004219		
	40	-11.60	-0.004474		
	50	-11.82	-0.004558		
16QAM					
3.7	-30	-17.24	-0.006649	Within authorized band for Band 41	Pass
	-20	6.82	0.002630		
	-10	-7.08	-0.002730		
	0	-10.80	-0.004165		
	10	10.07	0.003884		
	20	-13.70	-0.005283		
	30	-9.70	-0.003741		
	40	-13.73	-0.005295		
	50	9.60	0.003702		
64QAM					
3.7	-30	-12.23	-0.004717	Within authorized band for Band 41	Pass
	-20	10.33	0.003984		
	-10	-12.92	-0.004983		
	0	9.14	0.003525		
	10	-12.37	-0.004771		
	20	-13.69	-0.005280		
	30	9.58	0.003695		
	40	-11.74	-0.004528		
	50	-17.90	-0.006903		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	2.8	-17.40	-0.006710	Within authorized band for Band 41	Pass
	3.7	-15.16	-0.005847		
	4.2	-19.20	-0.007405		
16QAM					
25	2.8	-4.91	-0.001894	Within authorized band for Band41	Pass
	3.7	-13.20	-0.005091		
	4.2	-11.54	-0.004450		
64QAM					
25	2.8	-8.78	-0.003386	Within authorized band for Band41	Pass
	3.7	-14.91	-0.005750		
	4.2	8.24	0.003178		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 66 part:

Reference Frequency: LTE Band 66 (10MHz) Middle channel=132322 Frequency=1745.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.7	-30	-14.41	-0.008258	Within authorized band for Band 66	Pass
	-20	-5.94	-0.003404		
	-10	-10.51	-0.006023		
	0	-12.87	-0.007375		
	10	-12.86	-0.007370		
	20	9.03	0.005175		
	30	-9.88	-0.005662		
	40	-12.53	-0.007181		
	50	-14.06	-0.008057		
16QAM					
3.7	-30	-16.09	-0.009221	Within authorized band for Band 66	Pass
	-20	-18.38	-0.010533		
	-10	-10.96	-0.006281		
	0	-16.31	-0.009347		
	10	-18.81	-0.010779		
	20	-10.04	-0.005754		
	30	-16.54	-0.009479		
	40	-13.78	-0.007897		
	50	-13.68	-0.007840		
64QAM					
3.7	-30	-13.26	-0.007599	Within authorized band for Band 66	Pass
	-20	-9.97	-0.005713		
	-10	-9.16	-0.005249		
	0	-8.81	-0.005049		
	10	12.43	0.007123		
	20	-7.84	-0.004493		
	30	-7.88	-0.004516		
	40	6.37	0.003650		
	50	-10.29	-0.005897		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	2.8	-11.97	-0.006860	Within authorized band for Band 66	Pass
	3.7	-11.77	-0.006745		
	4.2	-7.84	-0.004493		
16QAM					
25	2.8	-14.89	-0.008533	Within authorized band for Band 66	Pass
	3.7	-10.19	-0.005840		
	4.2	-13.30	-0.007622		
64QAM					
25	2.8	-12.53	-0.007181	Within authorized band for Band 66	Pass
	3.7	-6.02	-0.003450		
	4.2	9.67	0.005542		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 71 part:

Reference Frequency: LTE Band71 (10MHz) Middle channel=133172 Frequency=668.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.7	-30	-9.77	-0.014626	Within authorized band for Band 71	Pass
	-20	-6.64	-0.009940		
	-10	-7.40	-0.011078		
	0	-12.92	-0.019341		
	10	-14.02	-0.020988		
	20	-5.38	-0.008054		
	30	-7.11	-0.010644		
	40	-10.00	-0.014970		
	50	-17.75	-0.026572		
16QAM					
3.7	-30	-10.04	-0.015030	Within authorized band for Band 71	Pass
	-20	-7.21	-0.010793		
	-10	-2.73	-0.004087		
	0	-10.46	-0.015659		
	10	-6.38	-0.009551		
	20	-2.27	-0.003398		
	30	-1.60	-0.002395		
	40	-6.95	-0.010404		
	50	-2.78	-0.004162		
64QAM					
3.7	-30	-6.22	-0.009311	Within authorized band for Band 71	Pass
	-20	-9.48	-0.014192		
	-10	-10.39	-0.015554		
	0	-9.20	-0.013772		
	10	-8.58	-0.012844		
	20	-2.50	-0.003743		
	30	-6.68	-0.010000		
	40	-15.01	-0.022470		
	50	-6.85	-0.010254		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	2.8	-11.36	-0.017006	Within authorized band for Band 71	Pass
	3.7	-5.88	-0.008802		
	4.2	-6.75	-0.010105		
16QAM					
25	2.8	-8.24	-0.012335	Within authorized band for Band 71	Pass
	3.7	-3.18	-0.004760		
	4.2	-9.30	-0.013922		
64QAM					
25	2.8	-6.14	-0.009192	Within authorized band for Band 71	Pass
	3.7	-11.89	-0.017799		
	4.2	-2.29	-0.003428		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 71 part:

Reference Frequency: LTE Band 71(10MHz) Middle channel=133297 Frequency=680.50MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.7	-30	-7.62	-0.011198	Within authorized band for Band 71	Pass
	-20	-8.84	-0.012990		
	-10	-11.83	-0.017384		
	0	-12.06	-0.017722		
	10	-12.03	-0.017678		
	20	-12.42	-0.018251		
	30	-11.82	-0.017370		
	40	-12.26	-0.018016		
	50	-7.94	-0.011668		
16QAM					
3.7	-30	-9.93	-0.014592	Within authorized band for Band 71	Pass
	-20	-12.90	-0.018957		
	-10	-13.65	-0.020059		
	0	-8.48	-0.012461		
	10	-7.65	-0.011242		
	20	-9.11	-0.013387		
	30	-8.41	-0.012359		
	40	-13.15	-0.019324		
	50	-8.97	-0.013181		
64QAM					
3.7	-30	-8.71	-0.012799	Within authorized band for Band 71	Pass
	-20	-7.55	-0.011095		
	-10	-15.22	-0.022366		
	0	-9.90	-0.014548		
	10	-8.91	-0.013093		
	20	-5.65	-0.008303		
	30	-9.58	-0.014078		
	40	-12.99	-0.019089		
	50	-14.68	-0.021572		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	2.8	-10.01	-0.014710	Within authorized band for Band 71	Pass
	3.7	-3.55	-0.005217		
	4.2	-7.02	-0.010316		
16QAM					
25	2.8	-11.42	-0.016782	Within authorized band for Band 71	Pass
	3.7	-13.05	-0.019177		
	4.2	-5.75	-0.008450		
64QAM					
25	2.8	-9.18	-0.013490	Within authorized band for Band 71	Pass
	3.7	-9.98	-0.014666		
	4.2	-3.63	-0.005334		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 71 part:

Reference Frequency: LTE Band 71 (10MHz) Middle channel=133422 Frequency=693.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.7	-30	-13.78	-0.019885	Within authorized band for Band 71	Pass
	-20	-13.62	-0.019654		
	-10	-10.61	-0.015310		
	0	-13.53	-0.019524		
	10	-14.63	-0.021111		
	20	-9.11	-0.013146		
	30	-13.63	-0.019668		
	40	-8.78	-0.012670		
	50	-8.81	-0.012713		
16QAM					
3.7	-30	-10.81	-0.015599	Within authorized band for Band 71	Pass
	-20	-7.37	-0.010635		
	-10	-8.91	-0.012857		
	0	-6.95	-0.010029		
	10	-13.13	-0.018947		
	20	-8.74	-0.012612		
	30	-8.91	-0.012857		
	40	-6.34	-0.009149		
	50	-11.24	-0.016219		
64QAM					
3.7	-30	-7.32	-0.010563	Within authorized band for Band 71	Pass
	-20	-9.37	-0.013521		
	-10	-7.87	-0.011356		
	0	-5.62	-0.008110		
	10	-6.64	-0.009582		
	20	-14.62	-0.021097		
	30	-4.48	-0.006465		
	40	-4.35	-0.006277		
	50	-11.13	-0.016061		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	2.8	-4.18	-0.006032	Within authorized band for Band 71	Pass
	3.7	-8.75	-0.012626		
	4.2	-5.66	-0.008167		
16QAM					
25	2.8	-15.58	-0.022482	Within authorized band for Band 71	Pass
	3.7	-8.84	-0.012756		
	4.2	-14.78	-0.021328		
64QAM					
25	2.8	-10.70	-0.015440	Within authorized band for Band 71	Pass
	3.7	-9.60	-0.013853		
	4.2	-6.51	-0.009394		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

Appendix G: Modulation Characteristics

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result	Verdict
Band2	20MHz	QPSK	18900	100RB#0	PASS	PASS
Band2	20MHz	16QAM	18900	100RB#0	PASS	PASS
Band2	20MHz	64QAM	18900	100RB#0	PASS	PASS
Band5	10MHz	QPSK	20525	50RB#0	PASS	PASS
Band5	10MHz	16QAM	20525	50RB#0	PASS	PASS
Band5	10MHz	64QAM	20525	50RB#0	PASS	PASS
Band12	10MHz	QPSK	23095	50RB#0	PASS	PASS
Band12	10MHz	16QAM	23095	50RB#0	PASS	PASS
Band12	10MHz	64QAM	23095	50RB#0	PASS	PASS
Band41	20MHz	QPSK	40620	100RB#0	PASS	PASS
Band41	20MHz	16QAM	40620	100RB#0	PASS	PASS
Band41	20MHz	64QAM	40620	100RB#0	PASS	PASS
Band66	20MHz	QPSK	132322	100RB#0	PASS	PASS
Band66	20MHz	16QAM	132322	100RB#0	PASS	PASS
Band66	20MHz	64QAM	132322	100RB#0	PASS	PASS
Band71	20MHz	QPSK	133322	100RB#0	PASS	PASS
Band71	20MHz	16QAM	133322	100RB#0	PASS	PASS
Band71	20MHz	64QAM	133322	100RB#0	PASS	PASS

Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.

Test Graphs

